Eric Tang 705579803
Yolanda Chen 005323226

Final Project Proposal

Overview

We plan to design a basic hangman game. The player can guess a letter in a word at a time, and the game will display the correct letters in the word guessed by the player and dash characters (**-**) for letters that are not guessed.

Game Mode

The player inputs letters by using the switches on the FPGA to form binary combinations of the alphabet. For example, the letter **a** is represented by the binary string **00001**, the letter **b** is represented by the binary string **00010**,...., the letter **z** is represented by the binary string **011010**. The player presses the right button on the FPGA (**btnR**) to submit their letter.

The game uses the four seven segment displays to display the word. For example, if the solution to the current stage is "apple", then the displays will first show "_ _ _ _ _". If the player guesses "a", then the displays will show "a _ _ _ _".

Score mode

The player starts off with 10 points each level. Each time the player guesses incorrectly, 1 point will be deducted. When the score reaches 0, the game will be over. The player earns a higher score by guessing the entire word with fewer wrong guesses. The score of the current level will be displayed on the Pmod SSD. After the player loses or completes all the levels, the total score will be displayed on the Pmod SSD.

Grading rubric

(20%) *Current score displays:*
Current score is set to 10 points at the start of each level and 1 point is deducted when the player guesses wrong. The player loses when it reaches 0. Current score is displayed on the Pmod SSD.

(10%) *Display game over message and total score*:
When the player loses (current score reaches 0), display a game over message "LOSe" and the total score the player has earned on the Pmod SSD.

(10%) *Display winning message and total score*:
When the player solves all the levels, display a winning message "YeAH" and the total score the player has earned on the Pmod SSD.

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(10%) *Choose letters*:
The player can choose a letter using the switches.

(10%) *Send button*:
The letter selected by the player using the switches will be sent to the program when the player presses **BtnR**.

(10%) *Levels*:
Advance to the next level after the player successfully completes the current level and presses **BtnR**. There are 5 levels in total.

(10%) *Word display*:
Display guessed letters correctly and dashes for unguessed letters.

(10%) *Invalid letter*:
Since we will use 5 switches in total but there are only 26 letters in the English alphabet, if the player sends an undefined switch combination (i.e. equals 0 or greater than 26), treat it as a wrong guess.

(10%) *Debouncing and Metastability*:
Our **BtnR** button and switches are able to handle unstable signals when being turned on and off.